## Applications of Radar Interferometry to Ice Sheet Research

R. Kwok (Jet l'repulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr, Pasadena, CA 91109; ph. 818 354-5614; c-mail: ron@rgps1 .jpl.nasa.gov); 1. Joughin (Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Dr, Pasadena, CA 91109; ph. 818-354-1235; e-mail: ian@rgps1 .jpl.nasa.gov); M. Fahnestock (J CESS, Dept. of Meteorology, University of Maryland, College Park, MD 20742; ph. 301-286-2142; c-mail: mark@firn.gsfc.nasa.gov)

Satellite radar interferometric data provide large-scale views of the topography and motion of the ice sheets and their associated ice streams and outlet glaciers. Typically, the observed fringe patterns in an interferogrrn are expressions of both ice motion and ice sheet tomographs. With a double difference procedure, wc were able to separate the field of icc motion and the topography into independent observations. Since the spatial sampling of these fields are comparable to that of the resolution of the imaging radar, the data provide details of topography and motion that have typically been unavailable in the observational literature. The interferometric observations provide only the motion along the line of sight of the radar thus requiring observations from ascending and descending passes to fully resolve the velocity field. 'l'his procedure to resolve this vector quantity is illustrated with a time-series of interferometric observations. The interferometrically- derived surface topography have been compared quantitatively with measurements from laser altimeters (AOL) and qualitatively with other imaging sensors. The derived ice motion have been used to compute mass flux of several glaciers using estimates of ice thickness over selected areas. '1'here is a wealth of information of in these derived datasets. We demonstrate the geophysical significance of these with examples from the NE Greenland ice stream, the Petermann and the Humboldt Glaciers. We also discuss some of the problems and limitations associated with using the present generation of satallite radars for supporting ice sheet investigations.

### American Geophysical Union Abstract Form

*Reference #* 0000
***Session 0.00***

1. 1995 Fall Meeting
2. 010195614
3. (a) Ron K wok
   MS ***300-235***
   J] 'I,
   4800 Oak Grove Dr
   Pasadena, CA 91109
   ron@rgps1.jpl.nasa.gov
   (b) 818-354-5614
   (c.) 818-393-5285
4. U
5. (a) U06 Geophysical Applications of Radar Interferometry
   (b) , ,
   (c)
6. N/A
7. 20% Fall AGU, 1994
8. $50 check enclosed.
9. C
10. Schedule after Joughin, Winebrenner and Fahnestock on the same topic. Schedule before Fahnestock, Kwok, Scambos on same topic.
11. Regular author